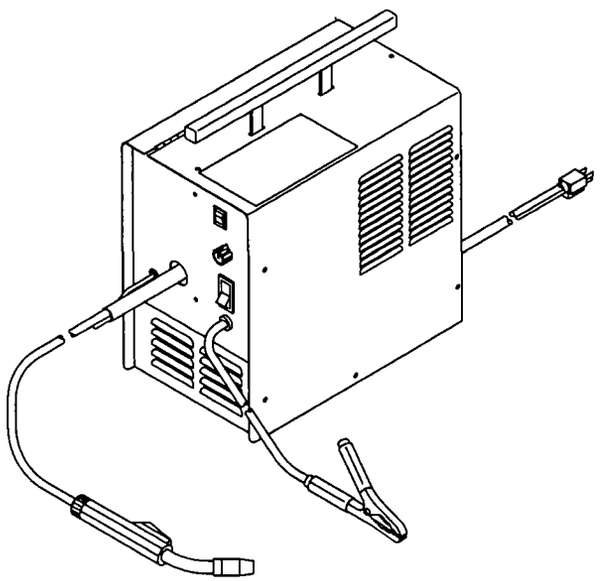
Miller®

Gold Seal™

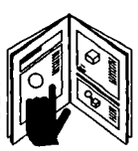
April 1993 Form: OM-157 745
Effective With Serial No. KD398640

OWNER'S MANUAL



Gold Seal™ Model 5000

- CV/DC Welding Power Source/Wire Feeder
- For FCAW Welding Or GMAW Welding With Optional Gas Valve
- Rated Output Of 70 Amperes At 16 Volts DC, 20% Duty Cycle
- Uses 115 VAC Single-Phase Input Power
- Motor Overload Protection
- Basic Model Includes Gun, Standard Model Adds Gas Valve, Deluxe Model Adds Gas Regulator/Flowmeter



- Read and follow these instructions and all safety blocks carefully.
- Have only trained and qualified persons install, operate, or service this unit.
- Call your distributor if you do not understand the directions.

- Give this manual to the operator.

- For help, call your distributor
- or: MILLER ELECTRIC Mfg. Co., P.O. Box 1079, Appleton, WI 54912 414-734-9821

cover 8/92 – ST-161 158

PRINTED IN USA

MILLER'S TRUE BLUE™ LIMITED WARRANTY

Effective January 1, 1992
(Equipment with a serial number preface of "KC" or newer)

This limited warranty supersedes all previous MILLER warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, MILLER Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new MILLER equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by MILLER. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, MILLER will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. MILLER must be notified in writing within thirty (30) days of such defect or failure, at which time MILLER will provide instructions on the warranty claim procedures to be followed.

MILLER shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, and are as follows:

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Robots
3. 2 Years — Parts and Labor
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
4. 1 Year — Parts and Labor
   * Motor Driven Guns
   * Process Controllers
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Running Gear/Trailers
   * Field Options

   (NOTE: Field options are covered under True Blue™ for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
5. 6 Months — Batteries
6. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts

MILLER'S True Blue™ Limited Warranty shall not apply to:

1. Items furnished by MILLER, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors and relays.
3. Equipment that has been modified by any party other than MILLER, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at MILLER'S option: (1) repair; or (2) replacement; or, where authorized in writing by MILLER in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized MILLER service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. MILLER'S option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a MILLER authorized service facility as determined by MILLER. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

RECEIVING-HANDLING

Before unpacking equipment, check carton for any damage that may have occurred during shipment. File any claims for loss or damage **with the delivering carrier**. Assistance for filing or settling claims may be obtained from distributor and/or equipment manufacturer's Transportation Department.

When requesting information about this equipment, always provide Model Designation and Serial or Style Number.

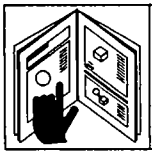
Use the following spaces to record Model Designation and Serial or Style Number of your unit. The information is located on the rating label or nameplate.

Model _____

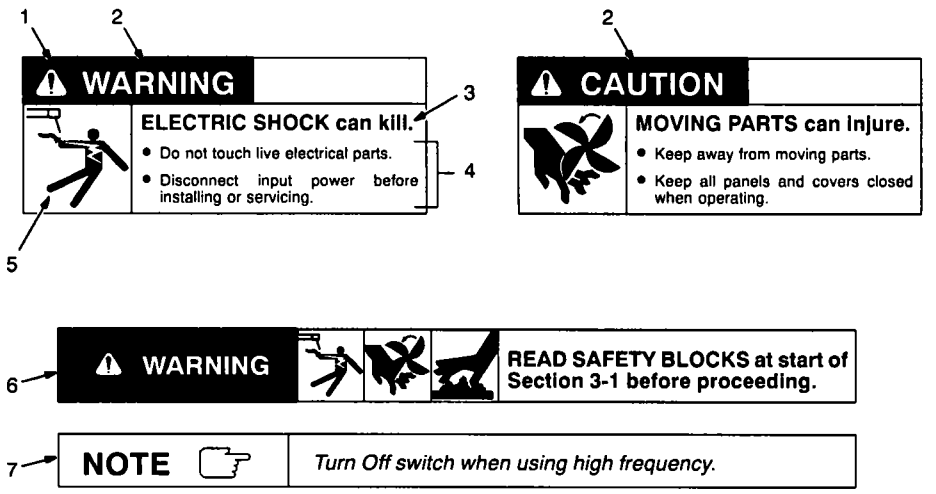
Serial or Style No. _____

Date of Purchase _____

ARC WELDING SAFETY PRECAUTIONS



- Read all safety messages throughout this manual.
- Obey all safety messages to avoid injury.
- Learn the meaning of WARNING and CAUTION.



1 Safety Alert Symbol

2 Signal Word

WARNING means possible death or serious injury can happen.

CAUTION means possible minor injury or equipment damage can happen.

3 Statement Of Hazard And Result

4 Safety Instructions To Avoid Hazard

5 Hazard Symbol (If Available)

6 Safety Banner

Read safety blocks for each symbol shown.

7 NOTE

Special instructions for best operation – not related to safety.

⚠ WARNING

ARC WELDING can be hazardous.

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR.

In welding, as in most jobs, exposure to certain hazards occurs. Welding is safe when precautions are taken. The safety information given below is only a summary of the more complete safety information that will be found in the Safety Standards listed on the next page. Read and follow all Safety Standards.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment.
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Turn off all equipment when not in use.
7. Do not use worn, damaged, undersized, or poorly spliced cables.
8. Do not wrap cables around your body.
9. Ground the workpiece to a good electrical (earth) ground.
10. Do not touch electrode while in contact with the work (ground) circuit.
11. Use only well-maintained equipment. Repair or replace damaged parts at once.
12. Wear a safety harness to prevent falling if working above floor level.
13. Keep all panels and covers securely in place.

ARC RAYS can burn eyes and skin; NOISE can damage hearing.

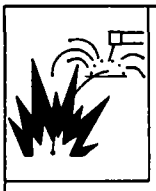
Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Wear a welding helmet fitted with a proper shade of filter (see ANSI Z49.1 listed in Safety Standards) to protect your face and eyes when welding or watching.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.

FUMES AND GASES can be hazardous to your health.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

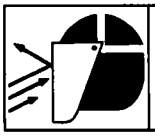
1. Keep your head out of the fumes. Do not breath the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



WELDING can cause fire or explosion.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.



FLYING SPARKS AND HOT METAL can cause injury.

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

PRINCIPAL SAFETY STANDARDS

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

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SECTION 1 – SPECIFICATIONS

Table 1-1. Welding Power Source

Specifications	Description
Type Of Output	Constant Voltage/Direct Current (CV/DC)
Rated Weld Output	70 Amperes, 16 Volts DC, 20% Duty Cycle
Type Of Input Power	Single-Phase; 60 Hz; At 115 Volts AC
Input Amperes At Rated Output	15 A
KVA/KW Used At Rated Output	2.2 kVA/2 kW
Max. Open-Circuit Voltage	29 Volts DC
Control Circuit Voltage At Gun	24 Volts DC
Welding Processes	Flux Cored Arc (FCAW) And Gas Metal Arc Welding (GMAW)
Speed Range At No Load	22 To 286 ipm (0.6 To 7.3 mpm)
Wire Diameter Range	.023 To .035 in (0.58 To 0.89 mm)
Overall Dimensions	Length: 16-1/2 in (419 mm); Width: 9-1/2 in (241 mm); Height: 17 in (432 mm)
Weight	Net: 53 lb (24 kg); Ship: 65 lb (29 kg)
Welding Gun	
Rated Output (Air Cooled)	160 Amperes At 60% Duty Cycle Using CO_2 Shielding Gas
Cable Length	10 ft (3 m)

1-1. Volt-Ampere Curve And Duty Cycle Chart

⚠ CAUTION

USING GUN BEYOND DUTY CYCLE RATING can damage gun.

- Do not use gun beyond rated amperage when using CO_2 shielding gas.
- Use gun at 30% duty cycle when using mixed shielding gas.

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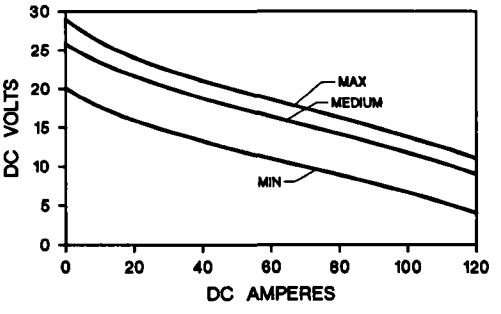

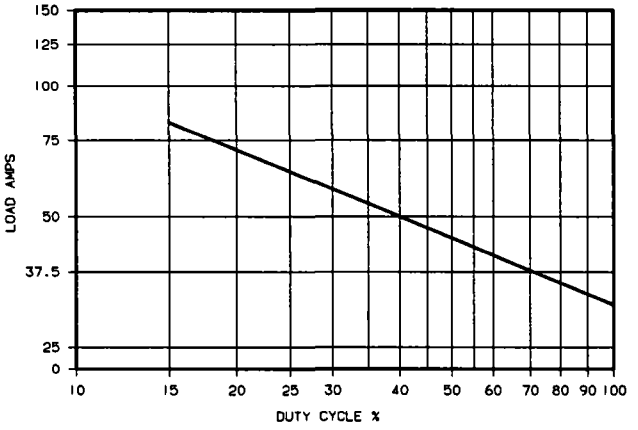

The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding power source. Curves of other settings fall between the curves shown.

Duty cycle is how long the unit can operate within a ten minute period without causing overheating or damage.

This unit is rated at 20% duty cycle allowing welding 2 minutes out of every 10 minutes.

This gun is rated at 60% duty cycle when using CO_2 shielding gas and 30% when using mixed shielding gas.

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Figure 1-1. Volt-Ampere Curve And Duty Cycle Chart

SECTION 2 – INSTALLATION

2-1. Installing Work Clamp

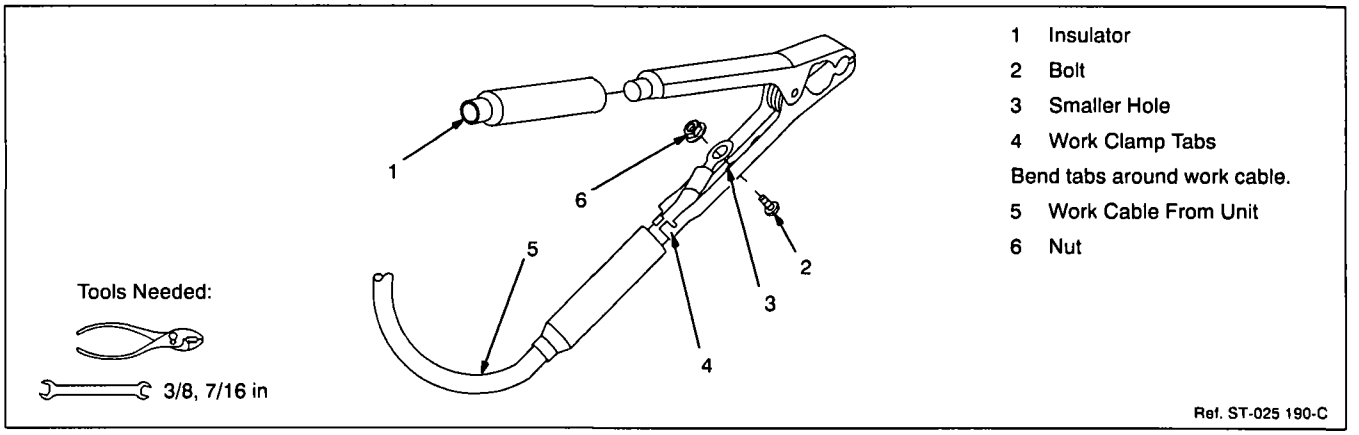

Figure 2-1. Installing Work Clamp

2-2. Gun Polarity For Wire Type

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting or installing.

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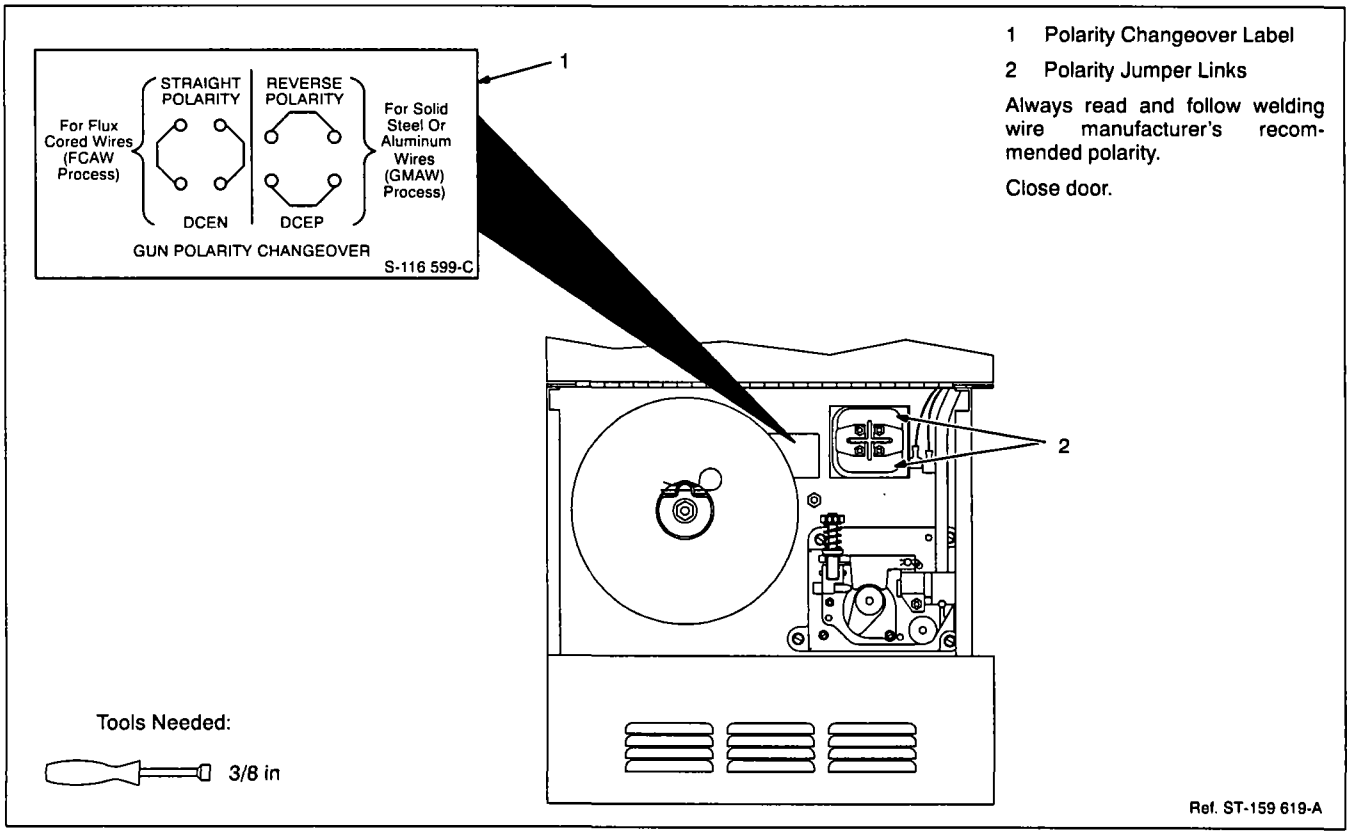
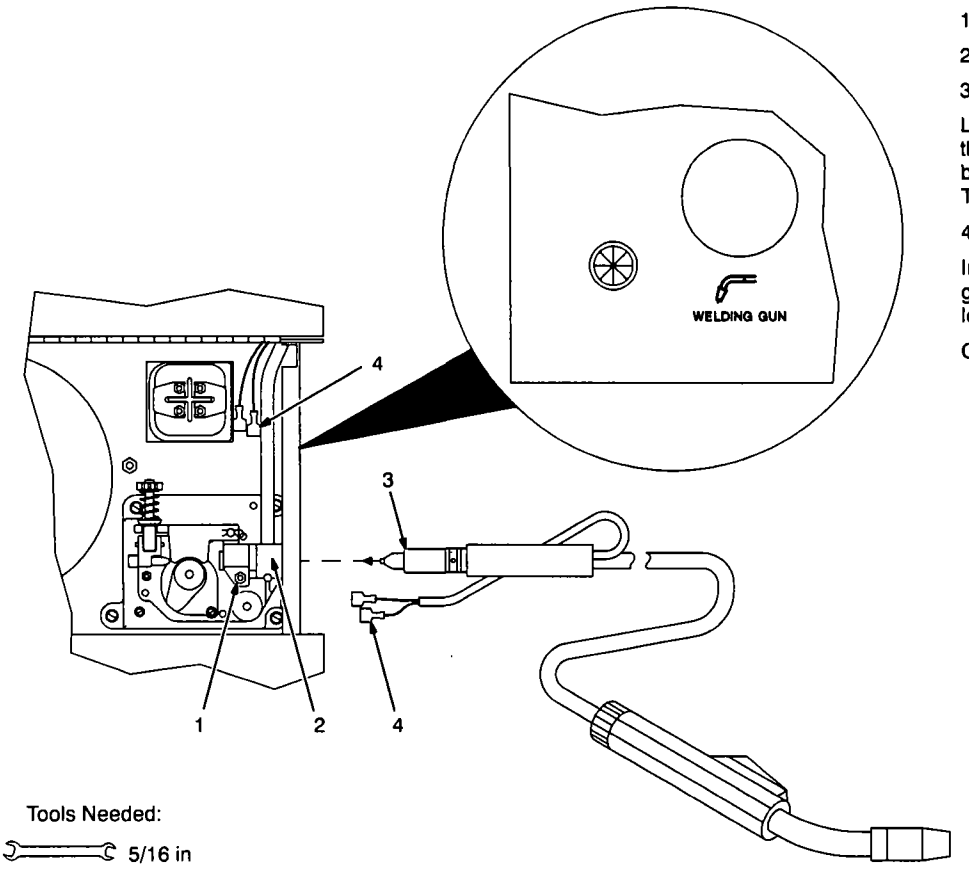


Figure 2-2. Gun Polarity Connections

2-3. Installing Welding Gun



1 Gun Securing Nut

2 Drive Assembly

3 Gun End

Loosen securing nut. Insert end through front panel opening until it bottoms against drive assembly. Tighten nut.

4 Gun Trigger Leads

Insert leads, one at a time, through grommet on front panel. Connect leads to matching leads in unit.

Close door.

Tools Needed:

5/16 in

Ref. ST-159 619-A / Ref. ST-159 216

Figure 2-3. Gun Connections

2-4. Connecting Input Power

Connect unit to a properly grounded 115 VAC receptacle of a 20 ampere individual branch circuit protected by time-delay fuses or circuit breakers. Select an extension cord of 12 AWG for up to 75 ft (23 m) or 10 AWG for up to 140 ft (46 m).

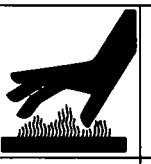
2-5. Threading And Feeding Welding Wire

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.

The welding wire, drive rolls, drive assembly, and all metal parts touching the welding wire are electrically live when welding or feeding wire using gun trigger.



HOT SURFACES can burn skin.

- Allow gun to cool before touching.

WELDING WIRE can cause puncture wounds.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

CYLINDERS can explode if damaged.

- Keep cylinders away from welding and other electrical circuits.
- Never touch cylinder with welding electrode.
- Always secure cylinder to running gear, wall, or other stationary support.

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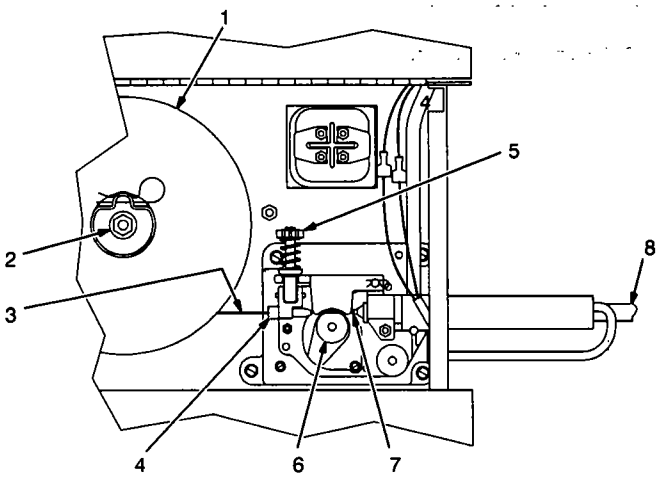


1 Wire Spool

2 Hub Tension Nut

Grasp spool. Turn while using wrench to adjust nut. When a slight force is needed to turn spool, tension is set.

3 Welding Wire

4 Inlet Wire Guide

5 Pressure Adjustment Knob

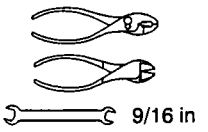
6 Drive Roll

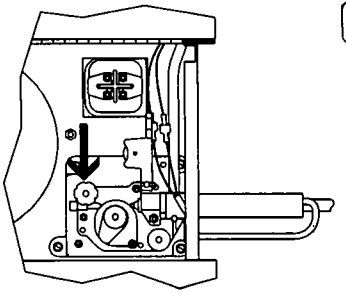
7 Outlet Wire Guide

8 Gun Conduit Cable

Lay gun cable out straight.

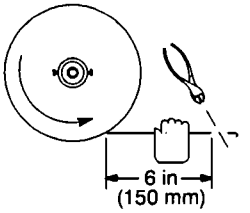
Tools Needed:



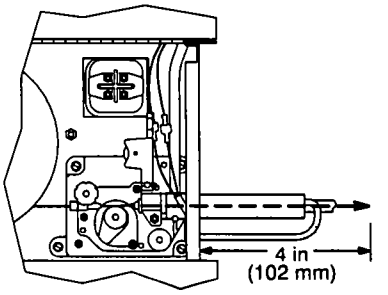


Open pressure assembly.

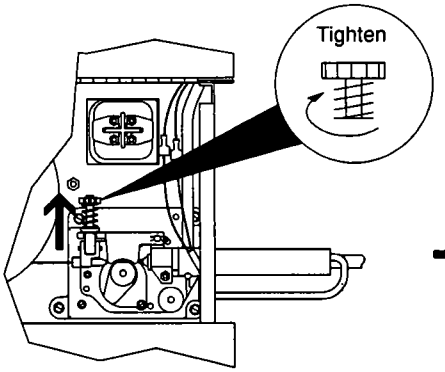
Hold wire tightly to keep it from unraveling.



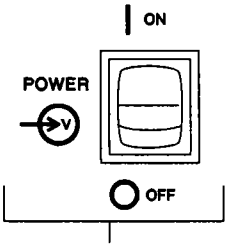
Pull and hold wire; cut off end.



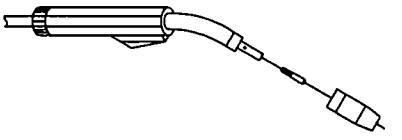
Push wire thru guides into gun; continue to hold wire.



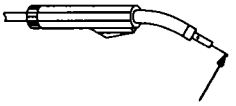
Close and tighten pressure assembly, and let go of wire.



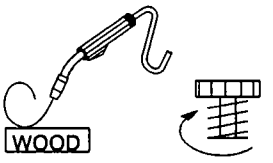
Set switch.



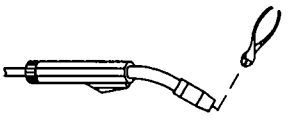
Remove gun nozzle and contact tube.



Press gun trigger until wire comes out of gun. Reinstall contact tube and nozzle.



Feed wire to check drive roll pressure. Tighten knob enough to prevent slipping.



Cut off wire. Close and latch door.

Ref. ST-161 157 / Ref. ST-159 615-A / Ref. ST-159 216 / S-0627-A

Figure 2-4. Feeding Welding Wire

2-6. Installing Gas Supply

⚠ WARNING

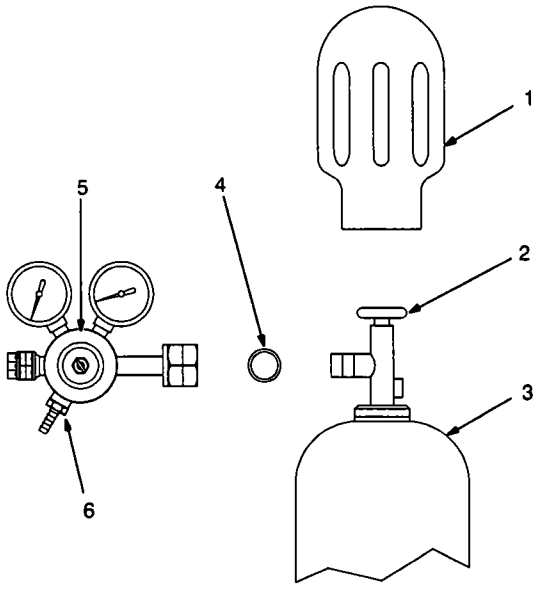
CYLINDERS can explode if damaged.

- Keep cylinders away from welding and other electrical circuits.
- Never touch cylinder with welding electrode.
- Always secure cylinder to running gear, wall, or other stationary support.

BUILDUP OF SHIELDING GAS can harm health or kill.

- Shut off shielding gas supply when not in use.

warn4.1 9/91



Tools Needed:

1-1/8, 5/8 in

Obtain gas cylinder and chain to running gear, wall, or other stationary support so cylinder cannot fall and break off valve.

1 Cap

2 Cylinder Valve

Remove cap, stand to side of valve, and open valve slightly. Gas flow blows dust and dirt from valve. Close valve.

3 CO_2 Cylinder

4 O-Ring

5 Regulator/Flowmeter

If not supplied, obtain proper regulator/flowmeter for use with CO_2 gas. Install onto gas cylinder so that face is vertical.

Flow rate for supplied regulator/flowmeter is set to 20 cfh (cubic feet per hour).

6 Gas Hose Connection

Obtain and install gas hose.

ssb3.1* 12/92 – ST-154 583 / ST-154 623

Figure 2-5. Installation Of Deluxe Model Regulator/Flowmeter

SECTION 3 – OPERATION

⚠ WARNING

READ SAFETY BLOCKS at beginning of manual before proceeding.

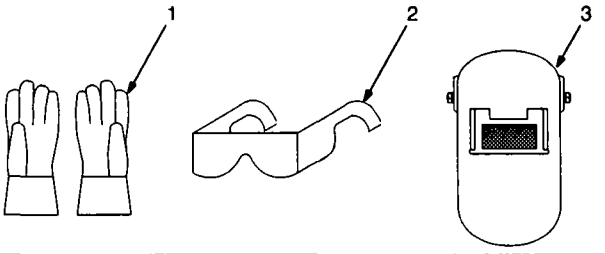
MOVING PARTS can cause injury.

- Keep away from pinch points such as drive rolls.
- Keep all doors, panels, covers, and guards closed and securely in place.

ARCING can damage switch.

- Do not change Thickness/Voltage switch position while welding.

Arcing inside switch can damage contacts, causing switch to fail.



1 Insulating Gloves

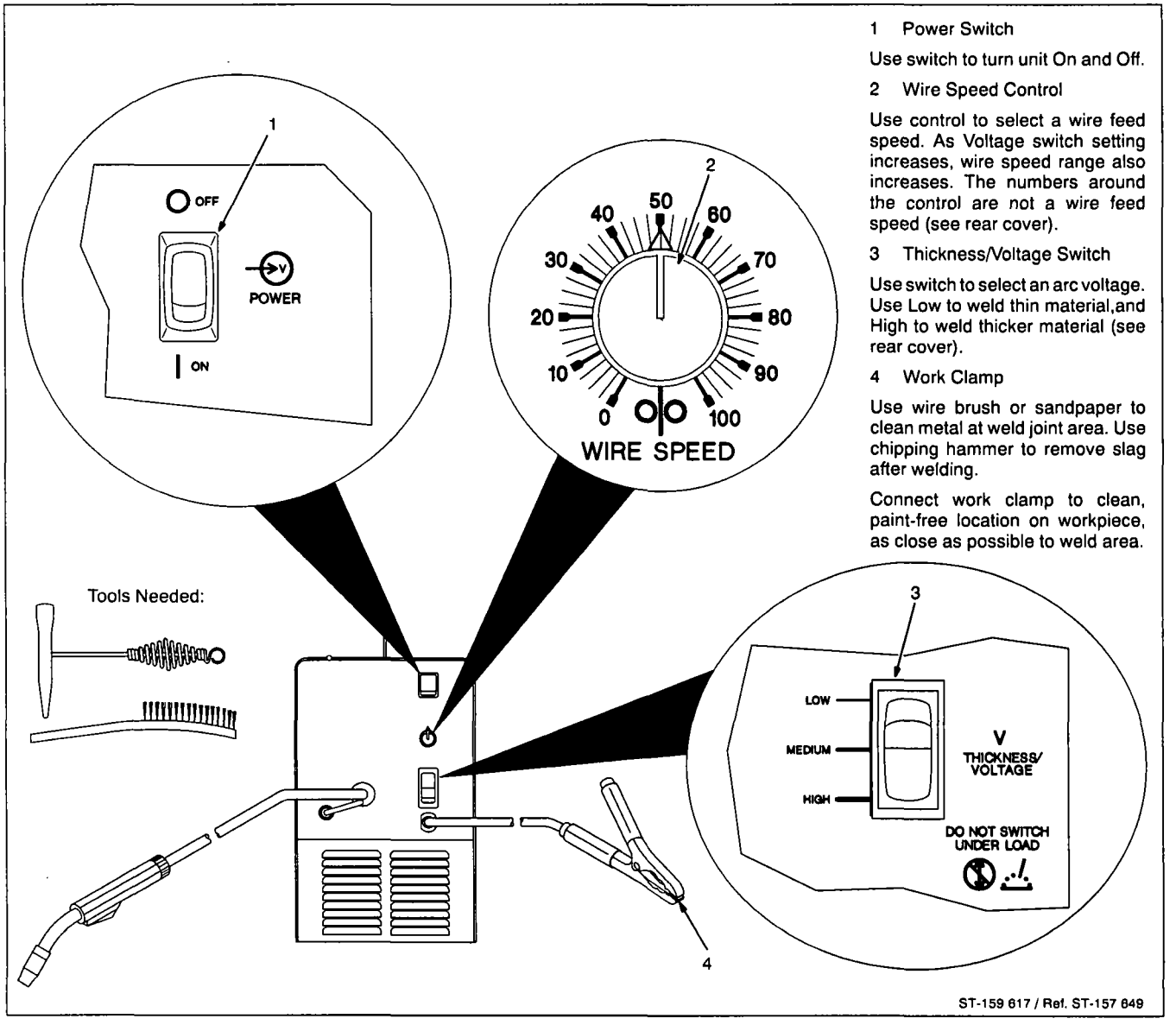
2 Safety Glasses With Side Shields

3 Welding Helmet

Wear dry insulating gloves, safety glasses with side shields, and a welding helmet with a correct shade of filter (see ANSI Z49.1).

sb3.1 10/91

Figure 3-1. Safety Equipment



1 Power Switch

Use switch to turn unit On and Off.

2 Wire Speed Control

Use control to select a wire feed speed. As Voltage switch setting increases, wire speed range also increases. The numbers around the control are not a wire feed speed (see rear cover).

3 Thickness/Voltage Switch

Use switch to select an arc voltage. Use Low to weld thin material,and High to weld thicker material (see rear cover).

4 Work Clamp

Use wire brush or sandpaper to clean metal at weld joint area. Use chipping hammer to remove slag after welding.

Connect work clamp to clean, paint-free location on workpiece, as close as possible to weld area.

ST-159 617 / Ref. ST-157 649

Figure 3-2. Controls

SECTION 4 – MAINTENANCE & TROUBLESHOOTING

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing.

HOT PARTS can cause severe burns.

- Allow cooling period before maintaining or servicing.

MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

Maintenance and troubleshooting to be performed only by qualified persons.

swarn8.2* 2/93

Table 4-1. Maintenance Schedule

Time	Maintenance
Before each use.	Tighten all connections. Check gun and clean nozzle.
After each spool of wire.	Blow out gun liner. Clean and check wire drive parts; replace as necessary.
Every 3 months.	Tape or replace cracked cables: clean and tighten connections. Replace unreadable labels.
Every 6 months.	Blow out or vacuum inside of unit.

4-1. Overload Protection

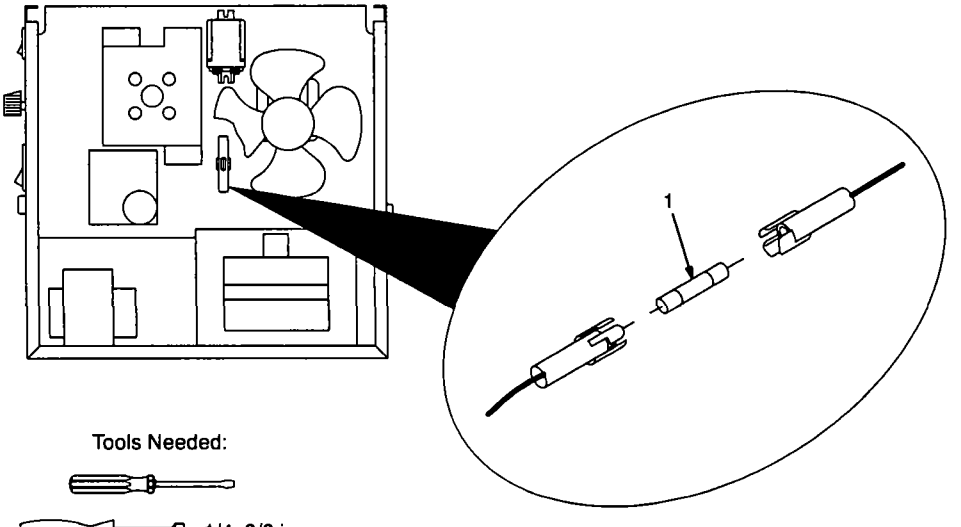
⚠ WARNING

READ SAFETY BLOCKS at start of Section 4 before proceeding.

A. Overheating

Thermostat TP1 protects the unit from damage due to overheating. If main transformer T1 gets too hot, TP1 opens and weld output stops. The fan keeps running to cool the transformer. Wait several minutes before trying to weld.

B. Motor Fuse F1



Turn Off and unplug unit. Unlatch door, remove handle, and remove door/wrapper.

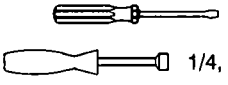
1 Fuse F1 (See Parts List For Rating)

If this fuse opens, the wire drive motor does not run.

Push on fuseholder and twist to open. Replace fuse.

Reinstall wrapper and handle, and latch door.

Tools Needed:



1/4, 3/8 in

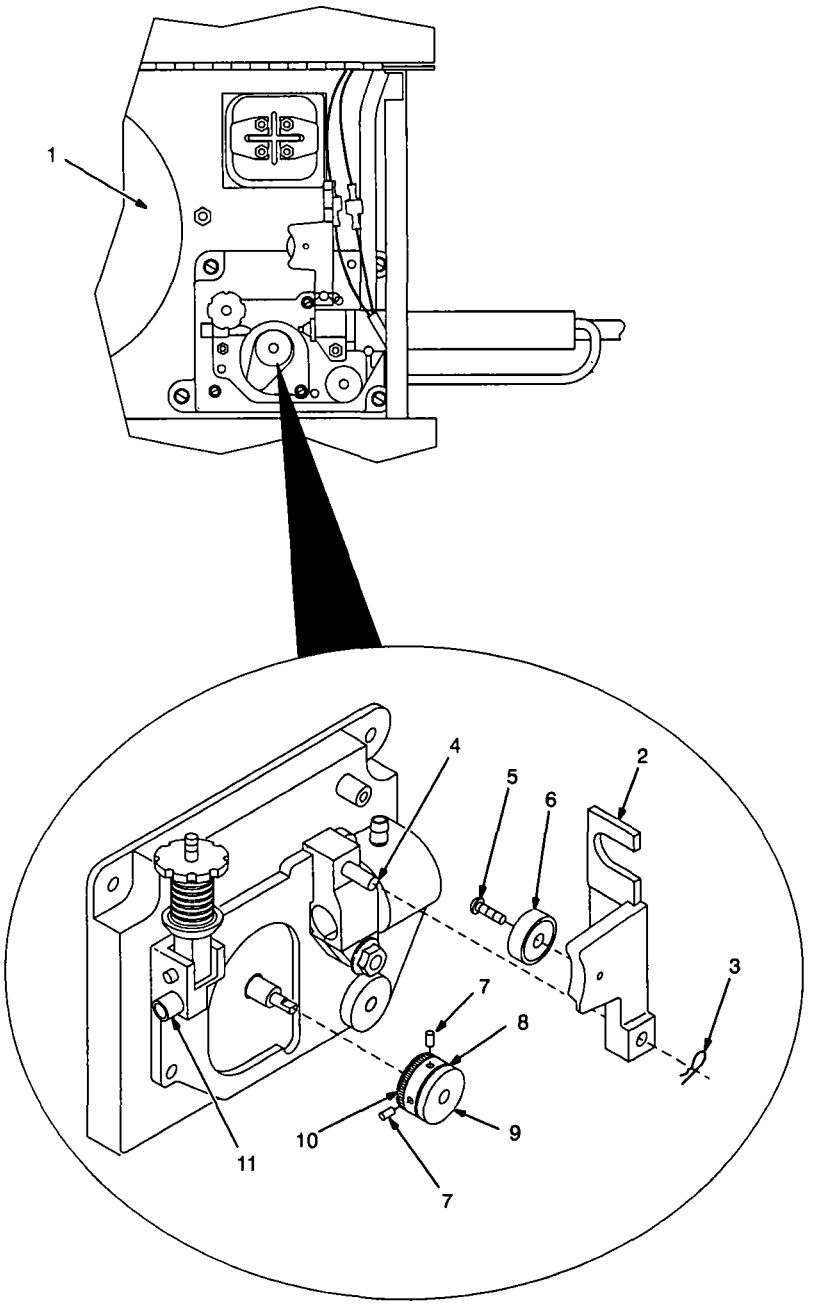
ST-159 618 / Ref. ST-152 031

Figure 4-1. Fuse F1 Location

4-2. Drive Assembly Maintenance

⚠ WARNING

READ SAFETY BLOCKS at start of Section 4 before proceeding.



Turn Off and unplug unit.

1 Wire Spool

Cut welding wire off at contact tube. Retract wire onto spool and secure.

2 Pressure Roll Arm

3 Cotter Pin

4 Pin

5 Screw

6 Bearing

Remove bearing as shown. Install new bearing and secure with screw. Reinstall arm onto pin and secure with cotter pin.

7 Setscrew

8 Smooth Groove For Hard Wire

9 Drive Roll

Remove drive roll as shown.

Use a wire brush to clean drive roll. Push drive roll onto shaft with desired groove in. Turn drive roll so one setscrew faces flat side of shaft, and tighten both setscrews.

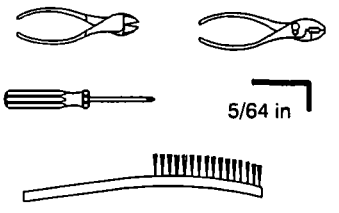
10 Knurled Groove For Flux-Cored Wire

11 Wire Inlet Guide

Remove guide by pressing on barbed area or cutting off one end near housing and pulling it out of hole. Push new guide into hole from rear until it snaps in place.

Thread welding wire (see Section 2-5). Close door.

Tools Needed:



Ref. ST-159 615-A / ST-154 199

Figure 4-2. Drive Assembly Maintenance

4-3. Gun Maintenance

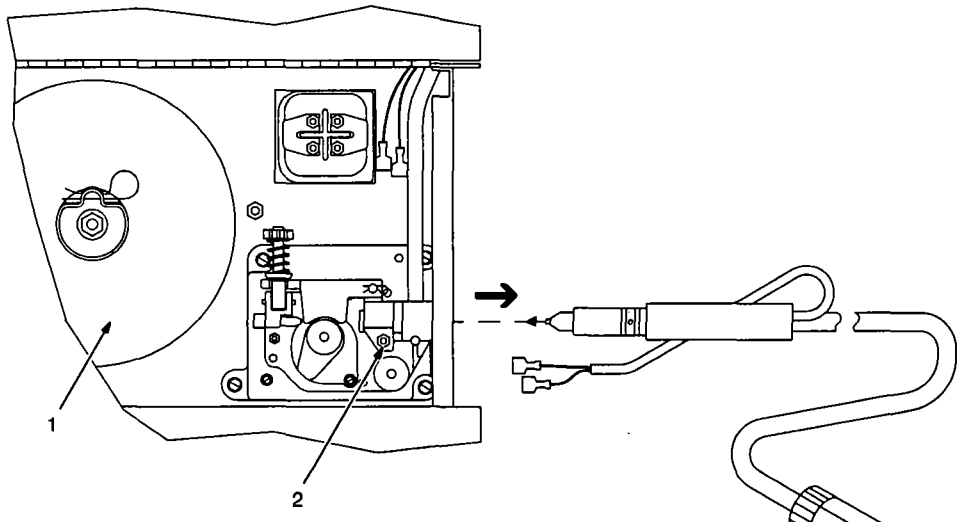
⚠ WARNING

READ SAFETY BLOCKS at start of Section 4 before proceeding.

FLYING METAL CHIPS AND DIRT can cause injury and damage equipment.

- Point gun away from people and in a safe direction when blowing out with compressed air.

swarn10.1 10/91



Turn Off and unplug unit.

1 Wire Spool

Cut welding wire off at contact tube. Retract wire onto spool and secure.

2 Gun Securing Nut

Disconnect trigger leads. Loosen nut and remove gun and trigger leads.

3 Nozzle

4 Contact Tube

5 Head Tube

6 Liner Collet

Disassemble gun as shown.

7 Liner

Pull liner from this end. Blow gun casing out with compressed air.

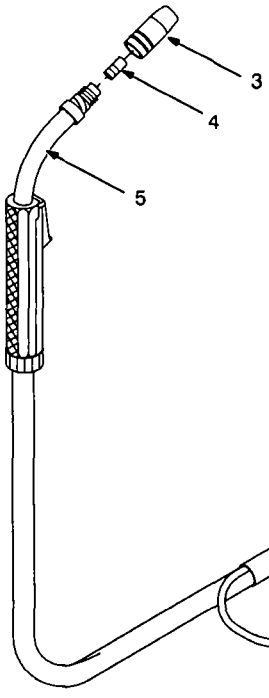
Insert new liner into gun casing until even with end of head tube.

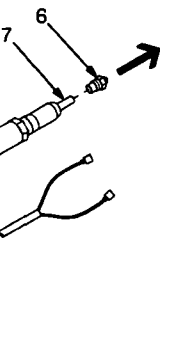
Install collet onto liner.

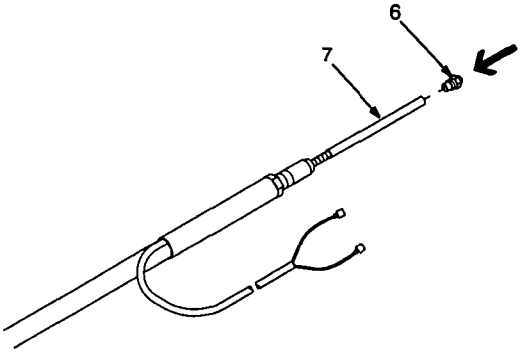
Install contact tube and nozzle.

Insert gun into feeder and mark where liner touches drive roll. Remove gun and cut liner off. Reinstall gun so that liner is as close as possible to drive rolls without touching.

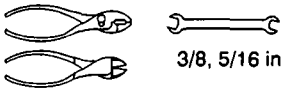
Thread welding wire (see Section 2-5). Close door.







Tools Needed:



3/8, 5/16 in

Ref. ST-159 619-A / Ref. ST-155 509

Figure 4-3. Gun Maintenance

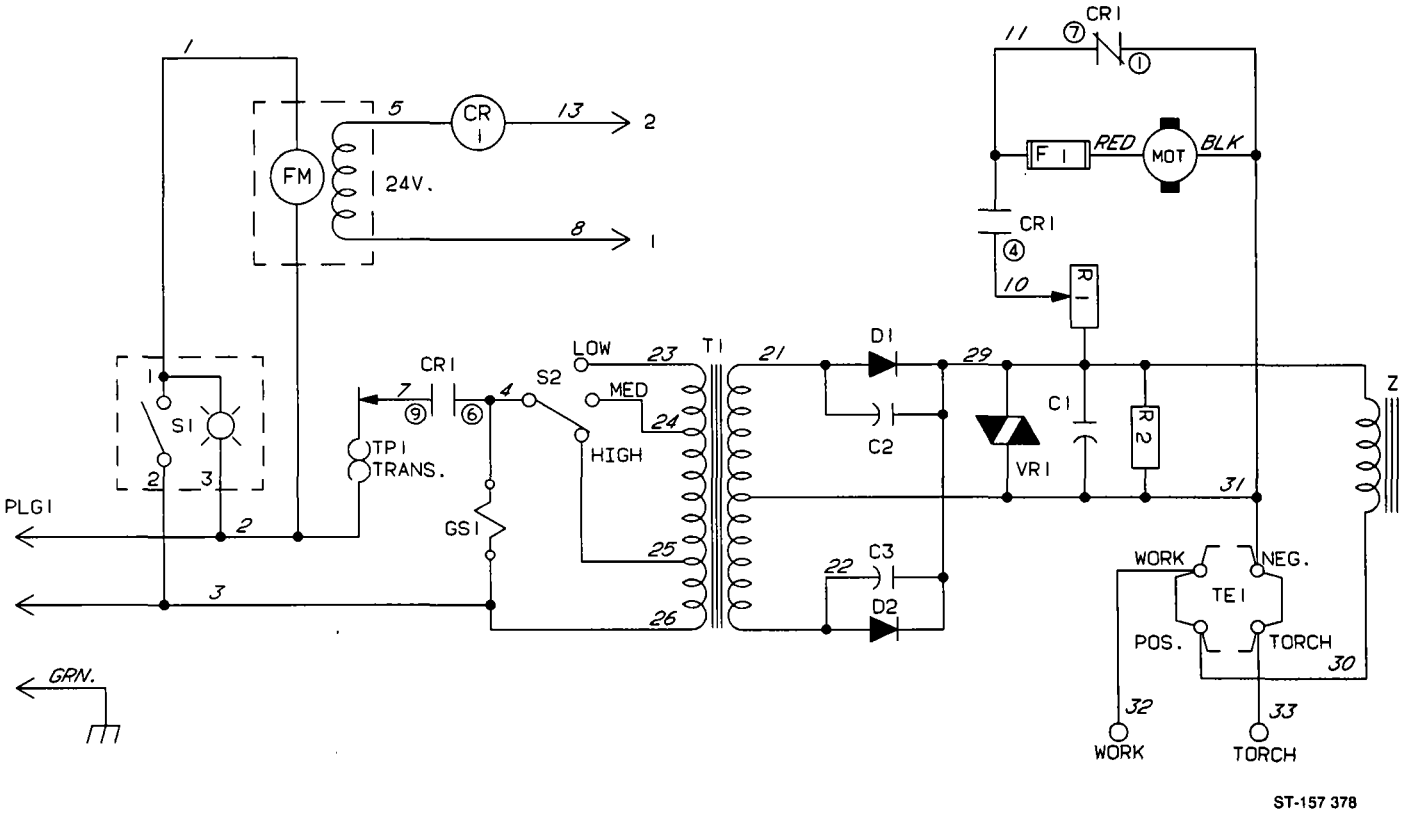
4-4. Troubleshooting

Table 4-2. Welding Trouble

Welding Trouble	Remedy	Section
No weld output; wire does not feed.	Secure power cord plug in receptacle.	2-4
	Motor fuse F1 open, replace fuse.	4-1B
	Replace building line fuse or reset circuit breaker if open.	--
	Secure gun trigger leads or repair leads, or replace trigger switch.	2-3
No weld output; wire does not feed; fan motor continues to run, and pilot light turns off.	Thermostat TP1 open (overheating). Allow fan to run; the thermostat will close when the unit has cooled.	4-1A
No weld output; wire feeds.	Connect work clamp to get good metal-to-metal contact.	Figure 3-2
	Replace contact tube.	4-3
Low weld output.	Connect unit to proper input voltage or check for low line voltage.	2-4

Table 4-3. Wire Drive/Gun Trouble

Wire Drive/Gun Trouble	Remedy	Section
Electrode wire feeding stops during welding.	Straighten gun cable and/or replace damaged parts.	4-3
	Adjust drive roll pressure.	2-5
	Readjust hub tension.	2-5
	Replace contact tube if blocked.	4-3
	Clean or replace wire inlet guide or liner if dirty or plugged.	4-2, 4-3
	Replace drive roll or pressure bearing if worn or slipping.	4-2
	Secure gun trigger leads or repair leads, or replace trigger switch.	2-3
	Check and replace F1.	4-1B
	Check and clear any restrictions at drive assembly and liner.	4-2, 4-3
	Have nearest Factory Authorized Service Station check drive motor.	--



ST-157 378

Figure 5-1. Circuit Diagram For Welding Power Source

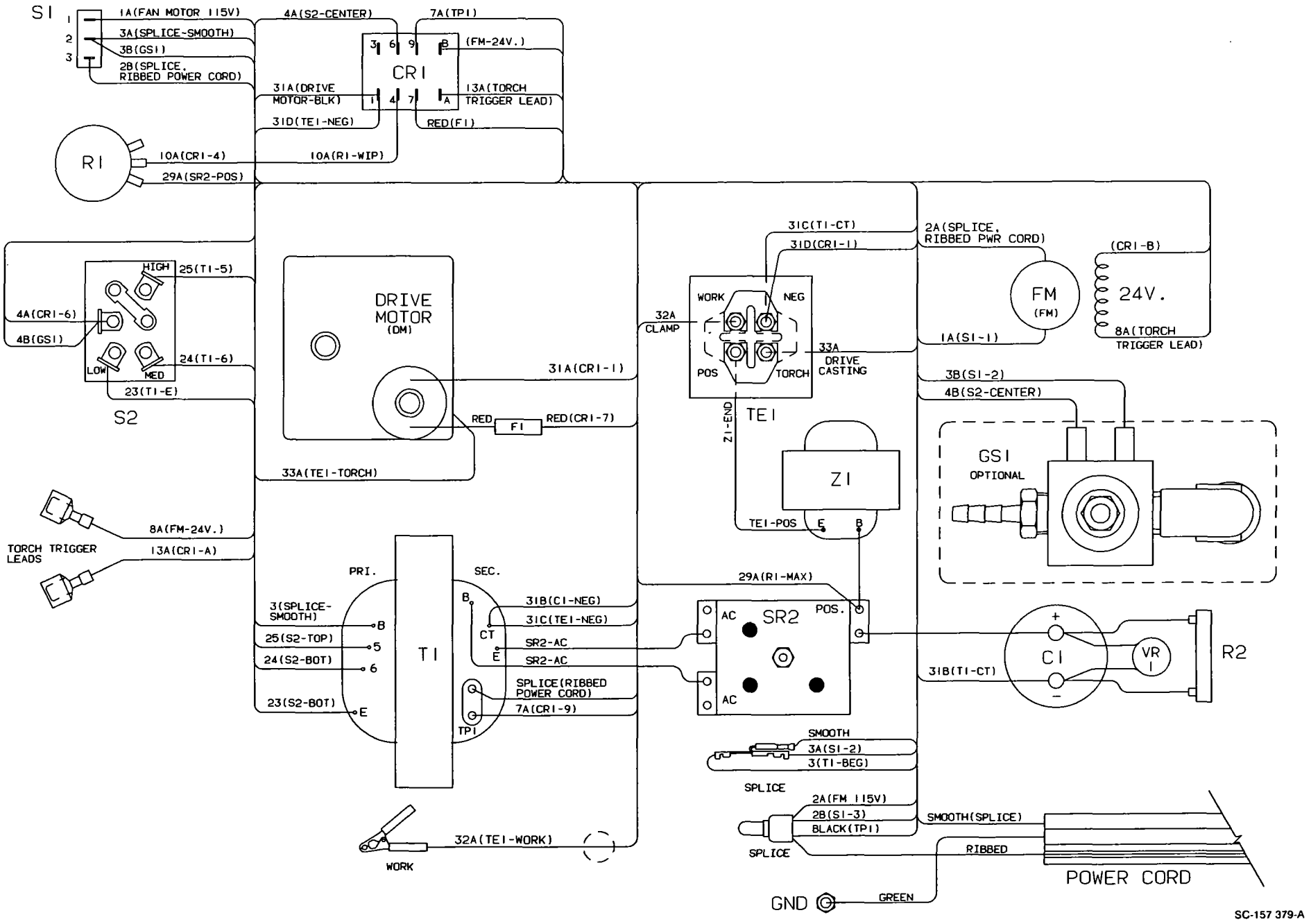


Figure 5-2. Wiring Diagram For Welding Power Source

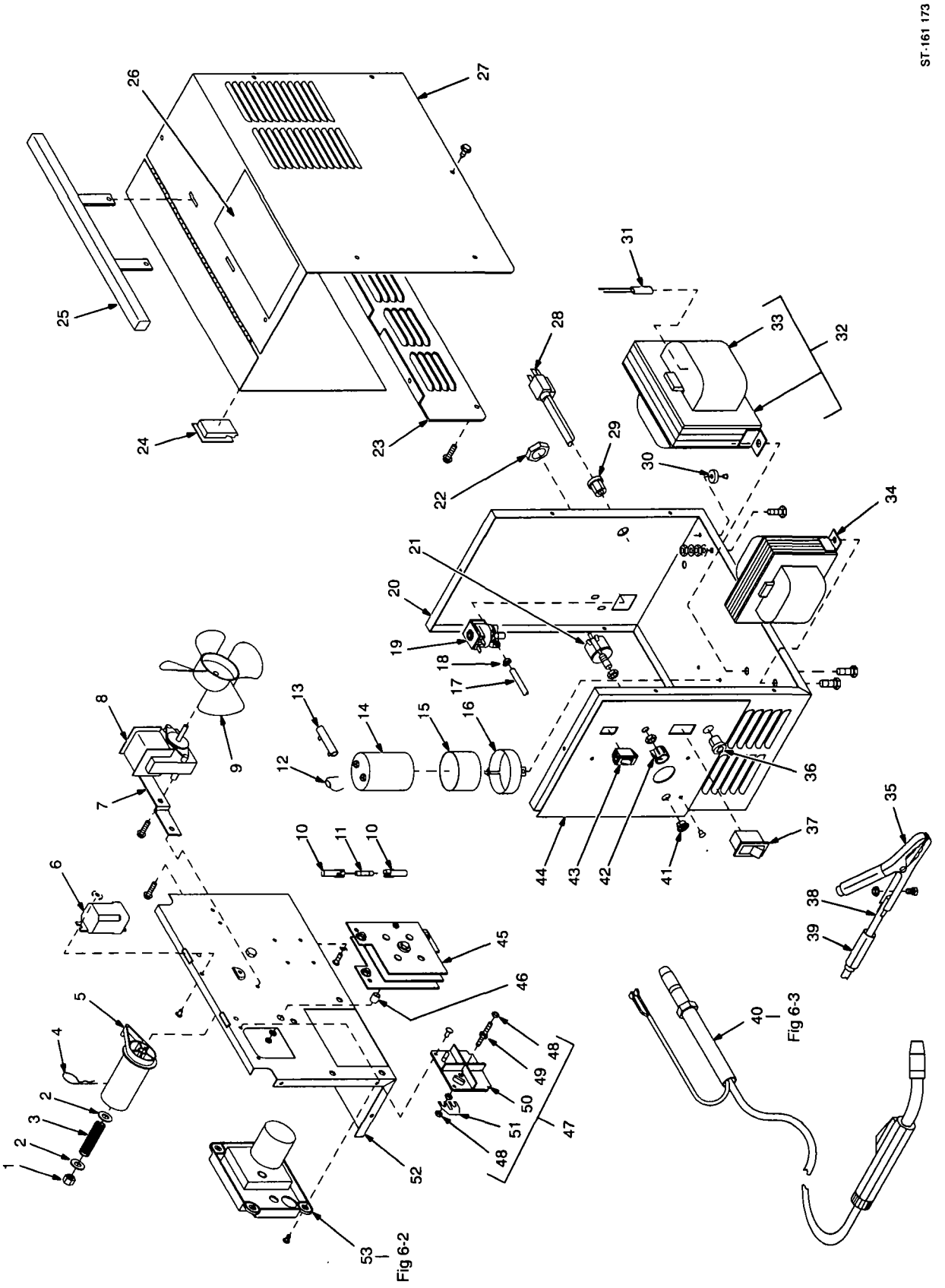


Figure 6-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 6-1. Main Assembly

1		010 909	NUT, stl slflkg hex .375-16	1
2		010 910	WASHER, flat stl SAE .375	2
3		073 355	SPRING, cprsn .625 OD x .093 wire x 1.000	1
4		111 998	PIN, cotter hair .120dia x 2.375 lg x .500 shaft	1
5		111 929	HUB, spool	1
6	CR1	120 706	RELAY, encl 24VAC DPDT	1
7		120 675	BRACKET, mtg motor fan	1
8	FM	111 931	MOTOR, fan 115V 50/60Hz 2600RPM .1818dia shaft	1
9		005 656	BLADE, fan 6 in 4wg 30deg .175 bore CW	1
10		053 297	HOLDER, fuse crtg in-line	1
11	F1	*012 663	FUSE, mintr gl slo-blo 3A	1
12	VR1	087 156	VARISTOR, 10 joule 68VDC	1
13	R2	117 116	RESISTOR, WW fxd 20W 50 ohm	1
14	C1	109 039	CAPACITOR, elctlt 46000uf 35VDC	1
15		161 439	STRIP, comb rmr .012 x 1.500 x 9.000	1
16		108 105	CLAMP, capacitor 2.500dia	1
17		134 834	HOSE, SAE .187 ID x .410 OD (order by ft)	3ft
18		149 322	CLAMP, hose .405-.485clp dia slfttng	2
29	GS1	116 996	VALVE, 115VAC 2 way custom port 1/8 orf (std & deluxe model)	1
		120 077	BLANK, snap-in nyl sq 1.250 (basic model only)	1
20		157 190	CASE SECTION, front/base/rear	1
21	R1	119 653	RHEOSTAT, WW 25W 25 ohm	1
22		605 227	NUT, nyl hex jam .750NPST (std & deluxe model)	1
23		157 187	PANEL, side	1
24		089 899	LATCH, slide	1
25		157 376	HANDLE, lifting	1
26		134 464	LABEL, warning general precautionary	1
27		+157 188	WRAPPER	1
28	PLG1	113 494	CORD SET, 125V 5-15P 14ga 3/c 7ft	1
29		111 644	BUSHING, strain relief .370/.430 ID x .875mtg hole	1
30		019 663	MOUNT, nprn 15/16 OD	4
31	TP1	120 638	THERMOSTAT, NC	1
32	T1	157 389	TRANSFORMER, pwr main 115 (consisting of)	1
33		157 447	. COIL, pwr main	1
34	Z	118 457	STABILIZER	1
35		010 368	CLAMP, grd 200A	1
36		111 443	BUSHING, strain relief .240/.510 ID x .875mtg hole	1
37	S2	157 305	SWITCH, rocker DPDT 15A 125VAC	1
38		600 325	CABLE, weld cop strd No. 6 (order by ft)	15ft
39		026 843	INSULATOR, vinyl blk	2
40		119 697	GA-16C1 GUN, (Fig 6-3)	1
41		025 338	BUSHING, nyl univ 23/32 hd dia .625mtg hole	1
42		097 922	KNOB, pointer	1
43	S1	153 698	SWITCH, rocker SPST 16A 125VAC	1
44			NAMEPLATE, (order by model and serial number)	1
45	SR2	119 264	RECTIFIER, si 1ph 100A 200PIV	1
46		010 047	TUBING, stl .625 OD x 12ga wall x 1.000	1
47	TE1	122 385	TERMINAL ASSEMBLY, chgov (consisting of)	1
48		601 835	. NUT, brs hex 10-32	8
49		038 887	. STUD, pri bd brs 10-32 x 1.375	4
50		116 620	. TERMINAL BOARD, chgov	1
51		038 618	. LINK, jumper term bd pri	2
52		157 191	BAFFLE, air	1
53		131 336	DRIVE ASSEMBLY, wire (Fig 6-2)	1
		059 712	CLIP, component .437dia mtg adh back	1
		153 714	REGULATOR/FLOWMETER, dual scale (deluxe model only)	1
		602 958	FITTING, brs barbed M 1/4tbg x 1/4NPT (deluxe model only)	1

*Recommended Spare Parts.
+When ordering a component originally displaying a precautionary label, the label should also be ordered.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		131 336	**Figure 6-2. Drive Assembly, Wire (Fig 6-1 Item 53)**	
1	MOT	119 021	MOTOR, gear 12VDC 80RPM	1
2		604 657	SCREW, .375-16 x 1.250 hexhd stl	1
3		602 213	WASHER, lock stl split .375	1
4		010 910	WASHER, flat stl SAE .375	1
5		128 189	SCREW, .312-18 x 1.750 hexhd stl	1
6		602 211	WASHER, lock stl split .312	1
7		604 538	WASHER, flat stl SAE .312	2
8		129 893	INSULATOR, housing drive	1
9		126 838	WIRE DRIVE, (consisting of)	1
10		090 416	PIN, hinge	1
11		124 817	HOUSING, wire drive	1
12		151 828	PIN, cotter hair .042 x .750	1
13		112 031	LEVER, pressure roll	1
14		090 443	BEARING, ball rdl sgl row .315 x .866 x .447	1
15		114 415	SCREW, 10-24 x .625 flathd-phl stl	1
16		010 224	PIN, spring CS .187 x 1.000	1
17		058 549	GUIDE, wire inlet 1/16	1
18		085 242	FASTENER, pinned	1
19		085 244	WASHER, cupped stl .328 ID x .812 OD x .125	1
20		090 415	SPRING, cprsn .720 OD x .072 wire x 1.250	1
21		092 237	KNOB, adj tension	1
22		602 204	WASHER, lock stl ext tooth No. 10	3
23		604 537	NUT, stl hex full .312-18	1
24		605 853	SCREW, 10-32 x .750 rndhd-slt stl	3
25		119 028	ROLL, drive V groove combination	1
26		602 169	SCREW, set 8-32 x .187 cup pt sch stl	2
27		601 862	NUT, stl hex 10-32	1
28		602 203	WASHER, lock stl split No. 10	1
29		604 673	SCREW, 10-32 x .625 flathd-slt stl	1

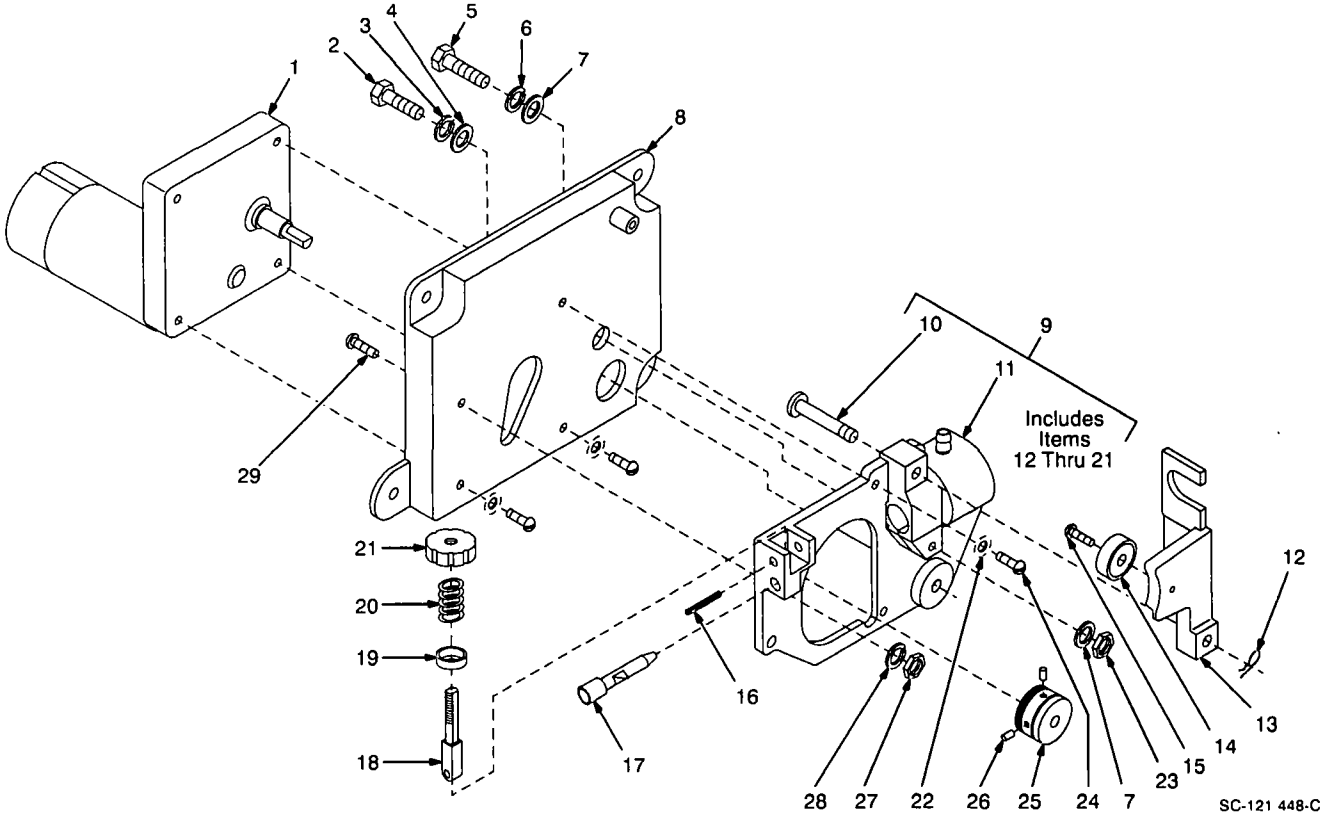


Figure 6-2. Drive Assembly, Wire

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Part No.	Description	Quantity
	119 697	**Figure 6-3. GA-16C1 Gun (Fig 6-1 Item 40)**	
1	110 793	HANDLE ASSEMBLY	1
2	110 795	TUBE, head (consisting of)	1
3	110 780	NUT, M10 x 1	2
4	110 779	JACKET, head tube	1
5	110 781	STOP, nozzle	1
6	128 878	ADAPTER, head tube/nozzle	1
7	110 782	SPRING, nozzle	1
8	110 786	TUBE, *contact .030 wire (quantity of 1 included with gun)*	3
9	110 789	NOZZLE, slip type 1/2 orf	1
10	110 794	TRIGGER SWITCH ASSEMBLY	1
11	080 565	TERMINAL, frict fem .110 x .016 22-18 wire	2
12	110 797	SLEEVE, rbr	1
13	120 714	LINER, monocoil .030-.035 wire w/collet 10ft (consisting of)	1
14	120 715	COLLET, liner .035 wire	1
15	079 974	O-RING, .500 ID x .103CS rbr	2
16	110 796	CONNECTOR, gun/feeder	1
17	047 994	TERMINAL, frict fem .250 x .032 22-18 wire	2
18	110 792	CABLE/CONDUIT, 10ft	1

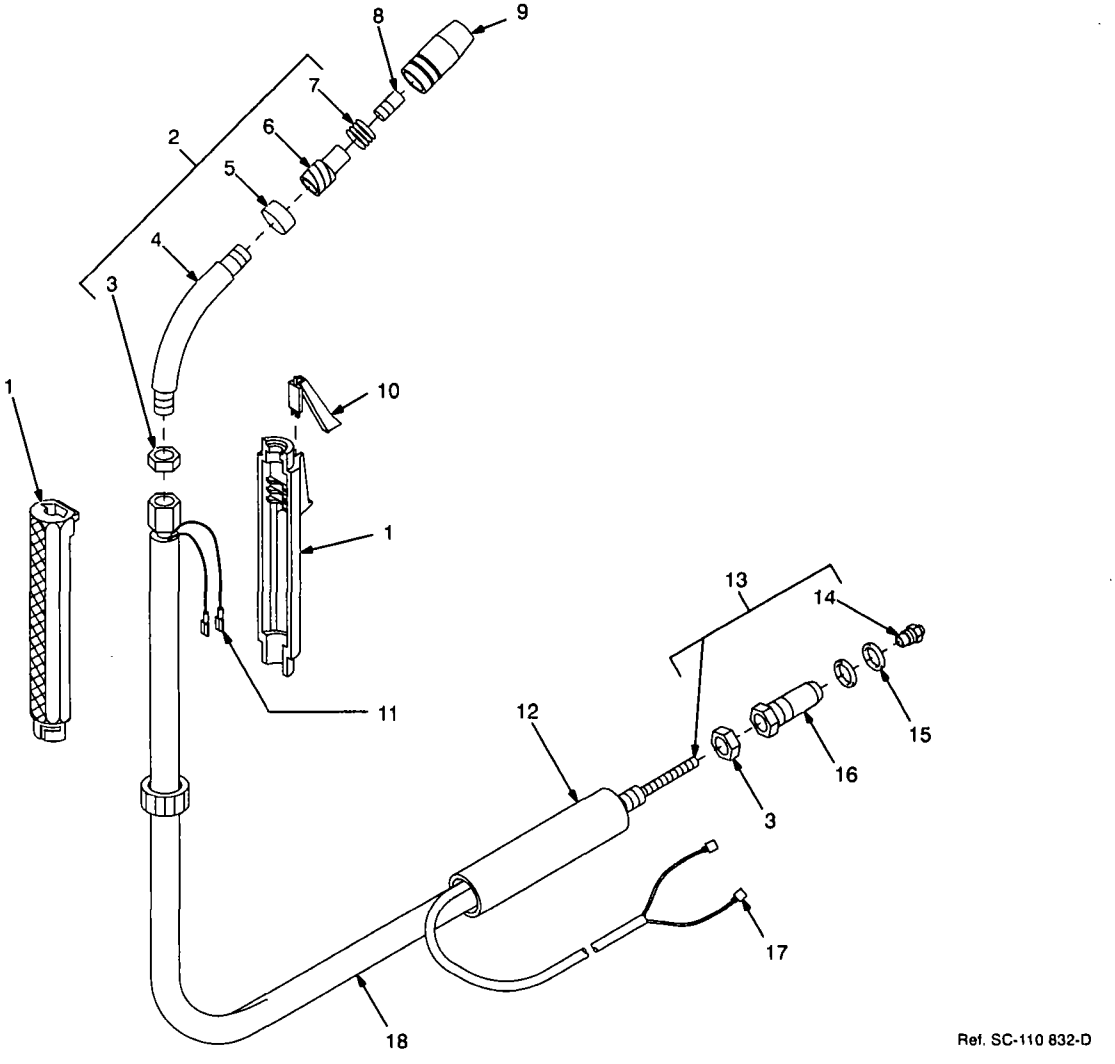


Figure 6-3. GA-16C1 Gun

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

SUGGESTED PARAMETERS FOR WELDING MILD STEEL

PROCESS	WIRE SIZE AND TYPE	WELDING POLARITY SETTINGS	STICK OUT	SHIELDING GAS	Material Thickness					
					CONTROL SETTINGS	Thinner Than 20 ga 0.0359 in (0.91 mm)	20-18 ga 0.0359-0.0478 in (0.91-1.21 mm)	17-15 ga 0.0538-0.0673 in (1.36-1.71 mm)	14-13 ga 0.0747-0.0897 in (1.89-2.28 mm)	12 ga and thicker 0.1046 in + (2.65 mm)
FCAW	0.030 in (0.76 mm) Flux Cored E-71T-GS	DCEN	1/2 in (12.7 mm)	NA	Voltage Adjustment	LOW	LOW	MEDIUM	MEDIUM	HIGH
					Wire Feed Adjustment Control	30	60	40	50	90
FCAW	0.035 in (0.889 mm) Flux Cored E-71T-GS	DCEN	1/2 in (12.7 mm)	NA	Voltage Adjustment	LOW	LOW	MEDIUM	MEDIUM	HIGH
					Wire Feed Adjustment Control	25	50	30	40	60
GMAW	0.023-0.025 in (0.58-0.64 mm) Solid Steel	DCEP	1/4 in (6.35 mm)	CO_2	Voltage Adjustment	LOW	LOW	MEDIUM	MEDIUM/HIGH	Not Recommended
					Wire Feed Adjustment Control	55	60	95	100	Not Recommended

Ref. S-157 696